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ACANTHOCEPHALA PARASITIC IN THE DOG*

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There are few published records of the occurrence of Acanthocephala in dogs. The available accounts show considerable uncertainty regarding the identification of the species encountered. It seems probable that the infestation of dogs in southern Europe by *Moniliformis moniliformis* is accidental and as Porta (1914: 484) has shown the case reported from Calcutta is probably that of a misidentified nematode. But one species has been recorded from dogs in North America. This species seems to have greater significance as a dog parasite than those reported elsewhere in that it seems to be a normal parasite of the dog since the worms reach full sexual development in this host.

In 1909 B. F. Kaupp described *Echinorhynchus canis* from specimens collected by J. W. Parker from a dog at San Antonio, Texas. Hall and Wigdor (1918) have recently called attention to the lack of subsequent references to Acanthocephala from dogs of this continent and have placed upon record one additional instance of an infestation by a single specimen of this species. Attempting to follow the recently proposed classification of Travassos the last mentioned authors have ascribed *E. canis* to the genus Oncicola though the explanations accompanying all of their text figures cite it as *Gigantorhynchus canis.* In their text mention is made of the difficulties encountered in attempting to determine the genus to which their single immature female specimen belongs.

J. W. Parker, the collector of the specimens upon which the original description of *Oncicola canis* (Kaupp) was based, published a note containing fairly significant additions to the biology of this species in the same volume of the journal which contained Kaupp's description. According to his account about three hundred specimens of this species were obtained from the single host individual which died of symptoms strongly indicative of rabies (Parker 1909: 703). Upon post mortem "numerous ulcerations, as from abrasions three or four days old, were found on the buccal and gingival membranes and tongue;" and "about three hundred small worms (*Echinorhynchus canis*) were found in the jejunum and ileum, chiefly in the ileum, most of them attached, in some cases the head penetrating mucous and muscular coats to the peritoneum." In speaking of the possible normal host of this parasite Parker continues, " 'Mad' coyotes are frequently reported in the vicinity, much more frequently than rabies is reported among domestic animals. I, therefore, think it probable that *Echinorhynchus canis* is normally a parasite of the coyote."

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The writer has encountered an instance of the occurrence of *Oncicola canis* from an unusual locality. A single specimen of this species contained in the collection of Professor Henry B. Ward was taken from a dog at Lincoln, Neb., by Dr. A. D. Brewer in 1897. Reference is made to this individual by Ward (1897: 174) as *Echinorhynchus sp?,* no attempt having been made at that time to determine the species. The present writer has examined the specimen, which has full bodily development though it is not gravid. The presence of the single female worm in the intestine of the host precluded the possibility of fertilization and embryo formation. There is no indication that Oncicola has become permanently established in the vicinity of Lincoln, for of the twenty dogs thoroughly examined in securing data for the tables published by Ward only the single instance was encountered, though "among the animals which were examined were representatives of various conditions of life under which these forms are found, both the half wild strays of the city streets and alleys and the pet animals of the home."

It is impossible to determine with certainty the source of this unusual infestation. However, since the armadillo carries the larvae of *O. canis* it seems probable that either the dog must at some time have been in the South where the larvae occur or it might have been allowed to feed upon offal from armadillos brought from the South as specimens. There is little danger that Oncicola may become established as a dog parasite beyond the geographical range of the armadillo unless it has the powers of adaptation to entirely new larval hosts. However, it seems probable that this parasite is much more prevalent as a dog parasite in the southwest than published accounts of its occurrences would indicate. Consequently since the present writer has discovered additional facts regarding this species, especially with reference to one of its larval hosts, it seems worth while to publish the results of this investigation.

Two of the original specimens of *Oncicola canis* are deposited in the Parasite Collection of the United States Public Health and Marine Hospital Service (cat. no. 9409), where they were received in October, 1902. Parker makes reference to his unsuccessful attempts to secure an identification of the specimens previous to the description given by Kaupp. The two specimens submitted to the Public Health Service fortunately include both a male and a mature female. Opportunity has been afforded the present writer to examine these specimens from the original lot and he has been able to establish the identity of these with previously unidentified larvae from the nine-banded armadillo contained in the collections of the U. S. National Museum and of the Bureau of Animal Industry. Three lots of these larvae were collected by Dr. Albert Hassall in Texas during October, 1891, (cat. nos.: B. A. I. Parasite Collection, no. 2077; Smithsonian Institution, Hassall Collection, no. 6312 and no. 6327). A fourth lot of larvae of this species bear the date of November, 1891, and were collected by Hassall from a specimen at Washington, D. C. The demonstration of the identity of these larvae with adults of *O. canis* establishes another link in the chain of the life cycle of this species. The excessively heavy infestation of the peritoneum of the abdomen of the armadillo renders the extent of the infestation in the dog encountered by Parker readily understandable.

The absolute relation of the armadillo in the life cycle of *O. canis* is not immediataely determinable. Almost without exception an arthropod serves as the primary host which ingests the passive, hard shelled embryos of the Acanthocephala. Vertebrates which shelter the larvae of these parasites usually bear the relation of intermediate host to the parasite. Hence it seems probable that the armadillo serves *Oncicola canis* as intermediate host and that some arthropod which is used by the armadillo as food acts as primary host.

The type of this genus, *Oncicola oncicola,* is found in South America where it is a normal parasite of *Felis onca* and *F. jaguarundi.* Travassos (1917: 50) has empirically stated that the eggs of *O. oncicola* are ingested by the armadillo (Tatus sp?) and that the larvae freed in the digestive tract penetrate the wall and become encysted in the connective tissue and muscles. Until a direct infestation of the vertebrate has been actually observed it is not safe to assume that the armadillo is the primary host of either species of this genus.

Unless the specimens found by Parker (1909) represent several distinct infestations it is difficult to believe that the ulcerations of the buccal membrane "as from abrasions three or four days old" could have been caused by individuals such as I have examined from his original collection. These specimens were fully mature, the female carrying abundant, fully formed embryos. The exact time required for completion of sexual development in the definitive host is not known for many species of Acanthocephala, but in most instances it covers a period of several weeks.

The hard shelled embryos within the body cavity of the mature female vary considerably in size, ranging, for *O. canis,* from 59 to 71μ in length and from 41 to 50μ in diameter. These measurements are considerably less than those given for *O. oncicola* by Travassos (1917). According to that author the embryos of the South American species are 99μ long and 71 to 75μ broad. Larvae from the peritoneum of the Armadillo are usually 4 mm. or more in length.

Facts are not available to make it possible to pass final judgment upon the prediction of Parker that the coyote may be a usual definitive host of this parasite. No one has ever published a report of having found Acanthocephala in the coyote. Very little work has been done to ascertain the effect of acanthocephalan parasites upon the host. However, the experiments of Grassi and Calandruccio (1888: 524) demonstrate that Acanthocephala when present in numbers cause the host to experience great pain. Calandruccio ingested a considerable number of the larvae of *Moniliformis moniliformis.* In 19 days he was attacked by acute pains accompanied by violent ringing of the ears and of the entire head. In this instance it took five weeks for the larvae to reach sexual maturity so that eggs were recovered from the feces of the patient. It is not at all impossible that pains such as those described by Calandruccio might drive a dog or a coyote "mad."

LITERATURE CITED

Grassi, B., and Calandruccio, S. 1888.—Ueber einen Echinorhynchus welcher auch im Menschen parasitirt und dessen Zwischenwirth ein Blaps ist. Centralbl. Bakt. Parasit., 3: 521-525.

Hall, M. C., and Wigdor, M. 1918.—Notes on the Acanthocephalid and Arthropod Parasites of the Dog in North America. Jour. Amer. Vet. Med. Assoc., n. s., 6: 493-500.

Kaupp, B. F. 1909.—Echinorhynchus canis. Amer. Vet. Rev., 35: 154-155.

Parker, J. W. 1909.—Echinorhynchus canis. Amer. Vet. Rev., 35: 702-704.

Porta, A. 1914.—Acantocefali nuovi e note sinonimiche. Zool. Anz., 44: 483-485.

Travassos, L. 1917.—Contribuicoes para o conhecimento da fauna helmintolojica brazileira. VI. Revisao acantocefalos brazileiros. Parte I. Fam. Gigantorhynchidae Hamann, 1892. Mem. Inst. Oswaldo Cruz, 9: 5-62.

Ward, H. B. 1897.—Animal Parasites of Nebraska. Report of the Zoologist. Ann. Rep. Nebr. Bd. Agr. for 1896, pp. 173-189.